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COATS & BENNETT, PLLC 1400 Crescent Green, Suite 300 Cary, NC 27518			ANDREASEN, DAVID S	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/597,229	Applicant(s) FIASCHI ET AL.	
	Examiner DAVID ANDREASEN	Art Unit 2416	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 November 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 9-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 July 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>7/17/2006</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. New corrected drawings for Figures 3 and 4 in compliance with 37 CFR 1.121(d) are required in this application because Figures 3 and 4 as disclosed in the specification are missing from the file. The corrected drawings are required in reply to this Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

Claim Objections

2. Claims 9 and 18 are objected to because of the following informalities: they each recite "replacing the current circuit ... with the ... circuit having *the least cost*" in step (b)(ii). Neither claim previously recites a least cost circuit. Each claim recites a circuit "having a lower cost difference" in step (b)(i). The circuit with the least cost *difference* with respect to a target circuit is not necessarily the circuit with the least *cost*. **As claimed, the replacement circuit in step (b)(ii) is not necessarily the calculated circuit from step (b)(i).** This does not appear in keeping with the spirit of the claim or the specification. **For the purposes of examination**, therefore, claims 9 and 18 are each interpreted as reading "replacing the current circuit ... with the ... circuit having the least cost *difference*" in step (b)(ii). Appropriate action is required, either in the form of

Art Unit: 2416

an amendment to the claim or a statement on the record that the claim is correct as presented.

3. Claim 11 is objected to because of the following informalities: it appears to contain a typographical error resulting in a missing word; it recites "...a cost associated an unused leg..." in line 2. **For examination purposes**, the excerpt is interpreted as "...a cost associated *with* an unused leg...." Appropriate correction is required.

4. Claims 14 and 15 are objected to because of the following informalities: they appear to contain a typographical error resulting in the wrong word; they recite "... the overall distance cost between the [two circuits]..." in lines 1-2. **For examination purposes**, the excerpt is interpreted as "...the overall *difference in* cost between the [two circuits]..." as this seems most consistent with the claims and specification. Appropriate action is required, either in the form of an amendment to the claim or a statement on the record that the claim is correct as presented.

5. Claim 17 is objected to because of the following informalities: it appears to contain a grammatical error; it recites "... performing the identified the series of single circuit movements ..." in lines 1-2. **For examination purposes**, the excerpt is interpreted as "...performing the identified *sequence* of single circuit movements ..." as this seems most consistent with the claims and specification, and in particular with claim 16. Appropriate correction is required.

Claim Rejections - 35 USC § 112, 2nd Paragraph

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 9 and 18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 9 and 18 recite the limitation "the criterion R_i " in step (b)(iii). There is insufficient antecedent basis for this limitation in the claim. Prior recitations identify "the demand R_i " and **for examination purposes** step (b)(iii) is interpreted as reciting "the *demand* R_i ."

8. Claim 13 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 13 recites "... determining whether the current set ... is *sufficiently* close ..." in line 2 and this renders the claim indefinite because it is impossible for one of ordinary skill in the art to determine how close is sufficiently close. Neither the claims nor the specification give a basis upon which one of ordinary skill in the art may give meaning to "sufficiently close" such as to determine the metes and bounds of the protection applicant is seeking and what activity would constitute

Art Unit: 2416

infringement. **For examination purposes, the claim is interpreted as best understood by the examiner.**

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

11. Claims 9-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,236,642 to Shaffer et al. (hereafter **Shaffer**).

12. Regarding claims 9 and 18, Shaffer discloses initializing a set of circuits (CI) to the set of actual circuits (CA) (Fig. 3, steps 202-204; wherein circuits are routed as they are requested, and the set of circuits may be deemed both actual circuits and an initial allocation of feasible intermediate circuits); for each demand to be processed (note that

Art Unit: 2416

each circuit, i.e., call, is a demand), calculating one or more candidate replacement circuits that satisfy the demand and have a lower cost difference with respect to a target circuit (Fig. 4, steps 252, 258, 253, 255, and 260; wherein a "new reservation" has an associated cost, and if the cost is less than that of the current circuit, the new route becomes a target circuit; the new route may also be deemed a candidate replacement circuit; note the difference in cost between the candidate replacement circuit and the target circuit will be zero and is a value lower than the difference in cost between the current circuit and the target circuit); replacing the current circuit with the candidate replacement circuit (Fig. 4, step 262; the current circuit is re-routed over the new circuit); marking the demand as having been processed (Fig. 4, step 262; upon re-routing, control of the algorithm is passed to Fig. 5, indicating that the demand has been processed).

13. Shaffer does not expressly disclose identifying the sequence with which circuits were replaced as the series of single circuit movements to re-route the network. It is common in the art, however, to log call reservation requests (Fig. 3, step 202; Fig. 4, step 253) and maintain records of such requests for billing and auditing purposes, especially if the request results in a connected call. It would have been obvious to one of ordinary skill in the art to record the sequence of call reservations, i.e., to identify the sequence with which circuits were replaced, each being a single circuit movement as claimed, in a system of Shaffer and for the benefit of billing and auditing.

Art Unit: 2416

14. Regarding claim 10, Shaffer further discloses wherein each circuit comprises one or more legs connecting two or more nodes (Fig. 2). Shaffer does not expressly disclose wherein calculating the cost difference of a circuit with respect to a target circuit comprises summing the costs of the legs of the circuit that do not overlap (i.e., that are disjoint) with the legs of the target circuit.

15. It is notorious within the art, however, that the cost or metric *difference* between two circuits may be determined by summing the costs of the legs of each circuit that *do not overlap*, and subtracting the two sums. In particular, it is notorious in the art that one need only consider those legs that the two circuits do not have in common, i.e., it is a well-known mathematical certainty that the legs in common cancel each other when a cost difference is calculated.

16. It would have been obvious to one of ordinary skill in the art, therefore, to calculate cost differences by considering only those legs of a circuit that are disjoint (i.e., those that are not in common, that do not overlap), summing their costs for each circuit, and taking the difference. To do so is a mathematical expediency for comparing relative circuit costs, e.g., cost differences.

17. Regarding claim 11, Shaffer does not expressly disclose wherein calculating the cost difference comprises excluding a cost associated with an unused leg of the target circuit.

18. It is notorious within the art, however, that the cost or metric *difference* between two circuits may be determined by summing the costs of the legs of each circuit that do

Art Unit: 2416

not overlap, *and subtracting the two sums*. In particular, and as applied to the instant situation, the subtraction “excludes” those legs of the target circuit that are unused by the candidate replacement circuit.

19. It would have been obvious to one of ordinary skill in the art, therefore, to calculate cost differences by excluding, i.e., subtracting, those legs of the target circuit that are unused by the candidate circuit. To do so is a mathematical expediency for comparing relative circuit costs, e.g., cost differences.

20. Regarding claim 12, Shaffer further discloses wherein the cost of a circuit is the sum of the cost of each circuit leg (col. 3, lines 41-43; col. 4, lines 51-52). Moreover, it is notorious in the art that the “cost” of a circuit or route is the sum of the costs of each circuit leg or route hop (See, e.g., Open Shortest Path First [OSPF], Enhanced Interior Gateway Routing Protocol [EIGRP] by Cisco Systems, Inc., etc.).

21. Regarding claim 13, Shaffer further discloses determining whether the current set of circuits is “sufficiently close” to the set of target circuits, or whether to repeat the step of calculating ever lower cost routes (Fig. 3, step 208; wherein it is considered whether the best available route is already in place before beginning optimization; see also Fig. 4, steps 260, 263, and 256; wherein the current route may be maintained, i.e., a determination that the current route is “sufficiently close” to optimal).

Art Unit: 2416

22. Regarding claim 14, Shaffer does not expressly disclose wherein the determination of claim 13 is made based on the overall difference in cost between the actual circuits and the feasible intermediate circuits.

23. It is well known in the art, however, that a set of circuits may be compared to another set of circuits to compare how similar or how efficient they are – at servicing a given set of demands – by taking the overall difference in cost (i.e., route or circuit metrics) between the two sets. It is also known to make a decision whether to continue with optimization efforts on the basis of such a comparison. For reference, see U.S. Patent No. 7,433,315 to Bhatia et al. wherein “network efficiency” is quantified and wherein re-optimization through re-routing is performed when the increase in efficiency that may be achieved exceeds a certain threshold.

24. It would have been obvious to one of ordinary skill in the art at the time of invention, when determining whether to continue with optimization as in Shaffer, to do so based on the overall difference in cost between the actual circuits and the feasible intermediate circuits.

25. Regarding claim 15, Shaffer does not expressly disclose wherein the determination of claim 13 is made based on the overall difference in cost between the feasible intermediate circuits and the target circuits.

26. It is well known in the art, however, that a set of circuits may be compared to another set of circuits to compare how similar or how efficient they are – at servicing a given set of demands – by taking the overall difference in cost (i.e., route or circuit

Art Unit: 2416

metrics) between the two sets. It is also known to make a decision whether to continue with optimization efforts on the basis of such a comparison. For reference, see U.S. Patent No. 7,433,315 to Bhatia et al. wherein “network efficiency” is quantified and wherein re-optimization through re-routing is performed when the increase in efficiency that may be achieved exceeds a certain threshold.

27. It would have been obvious to one of ordinary skill in the art at the time of invention, when determining whether to continue with optimization as in Shaffer, to do so based on the overall difference in cost between the feasible intermediate circuits and the target circuits.

28. Regarding claim 16, Shaffer does not expressly disclose providing the identified sequence of single circuit movements to a network manager for implementation on the network. Shaffer is directed to re-routing circuits in a network when the opportunity exists to achieve a lower cost routing for any of a number of existing circuits. As a network feature that implements a per-circuit operation, it would be typical that the feature of Shaffer be configurable, e.g., that it be capable of being enabled or disabled by a network manager per network or per circuit.

29. It would have been obvious, therefore, to one of ordinary skill in the art at the time of invention to implement Shaffer’s circuit re-routing feature as an option for a network manager to decide whether to enable or disable. It would further be obvious to provide to the network manager a set of contingent circuit re-routings so that the

Art Unit: 2416

network manager may make an informed decision whether to enable or disable the feature.

30. Regarding claim 17, Shaffer does not expressly disclose performing the identified sequence of single circuit movements on a network by the network manager. Shaffer is directed to re-routing circuits in a network when the opportunity exists to achieve a lower cost circuit routing for any of a number of existing circuits. As a network feature that implements a per-circuit operation, it would be typical that the feature of Shaffer be configurable, e.g., that it be capable of being enabled or disabled by a network manager per network or per circuit.

31. It would have been obvious, therefore, to one of ordinary skill in the art at the time of invention to implement Shaffer's circuit re-routing feature as an option for a network manager to decide whether to enable or disable. It would further be obvious to provide to the network manager a set of contingent circuit re-routings so that the network manager may make an informed decision whether to enable or disable the feature. Enabling the feature would then perform, by the network manager's selection, the single-circuit movements.

Pertinent Prior Art

32. The prior art made of record is considered pertinent to applicant's disclosure:

WO 2004/036814 by Gous – discloses a cost-based routed network and the generation of a sequence of intermediate network plans to be used as a migration path from a first routing state to a second routing state; the progression from one intermediate network plan to the next is implemented via a series of single changes to network topology or metrics and not via a series of single circuit movements.

U.S. Patent No. 6,236,642 to Shaffer et al. – discloses a dynamic network optimization scheme wherein circuits are continuously examined to determine whether a better, i.e., lower cost metric, route is available; circuits are replaced with better routes as they are identified, resulting in a series of single-circuit movements that tend to optimize the network.

U.S. Patent No. 7,433,315 to Bhatia et al. – discloses a method for identifying when a network may benefit from re-optimization (i.e., the re-routing of circuits) by quantifying "network efficiency" on a profit-basis or cost-basis; re-optimization is taken when the increase in efficiency that may be gained exceeds a certain threshold; also teaches that achieving the improved re-optimization should be done with a substantially minimum number of re-routings.

33. The independent claims of the instant application recite the identification of single circuit movements in a progression toward a set of target circuit routings. In the method of independent claim 9 and the network of independent claim 18, target circuits are introduced in the preamble but the identification or selection of target circuits is not affirmatively claimed in any of the claims. The instant claims therefore allow for the

Art Unit: 2416

identification of any target circuit, including but not limited to any circuit with routing more desirable than the current circuit. Further, the examiner interprets the claims to require the contemplation of at most only one circuit movement. The overall effect is that independent claims 9 and 18 require at most the identification of a single circuit movement on the basis of a cost difference, and Shaffer is therefore deemed by the examiner to be the closest art of record to the claims as presented.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DAVID ANDREASEN whose telephone number is 571-270-7649. The examiner can normally be reached on Mon - Thu 8:00 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chi Pham can be reached on 571-272-3179. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2416

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